

NorthWestern Energy  
Docket No. N2005.12.172  
2005  
Electric Default Supply Procurement Plan  
  
Montana Public Service Commission (PSC)  
PSC Set 1  
Data Requests Received March 21, 2006

PSC-001                      Regarding: PSC concerns with the 2004 Plan  
                                    Witness: unknown

- a.        In volume 2, Chapter 1, p 31, the 2005 Plan describes specific concerns expressed by the Commission regarding the 2004 Plan. Item 3 refers to immediately evaluating alternatives to the PPL contracts. On p 33, the 2005 Plan states that some of the Commission's concerns were addressed through the 2004 RFP and resulting resource procurements, others are addressed in the 2005 Plan, and others remain unaddressed. Was the concern related to immediately evaluating alternatives to the PPL contract addressed, in whole or in part, through the 2004 RFP and resulting resource procurements? Please explain.
- b.        In Volume 1, p. 11, the 2005 Plan states that NWE has secured 40% of the energy that will no longer be available from PPL Montana in 2007. Please provide a worksheet that demonstrates the calculation of the 40% figure and identifies the source(s) of the energy.
- c.        In Volume 2, Chapter 1, p. 35, Figure 1-5 shows several short-term power supply products that were purchased as a result of the 2004 RFP. Please explain whether NWE considered conducting additional RFPs for short-term resources after the 2004 RFP and, if so, why the Company decided not to issue additional RFPs.
- d.        Volume 2, Chapter 1, p. 36 shows that a dispatchable product from the MFM project was selected in the 2004 RFP. Please explain the factors that resulted in the utility's decision not to procure this resource.
- e.        Please describe the proposed (in the bid) term of the 50 MW PPL Montana unit-contingent, off-peak resource described in Volume 2, Chapter 1, p. 36. If this resource was not procured, please explain the factors that resulted in the utility's decision not to procure it.

RESPONSE:

- a.        NWE has and continues to evaluate options to replace the PPL contracts. As noted in the question, NWE conducted an all-source RFP in 2004. Four resources were selected and NWE successfully negotiated contracts for one project, 135-150 MW of wind power from Judith Gap Energy LLC; and the NorthWestern Corporation has committed 90 MW of unit contingent base load power from NorthWestern Corporation's unregulated leasehold interest in Colstrip Unit 4. In addition, since the

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conclusion of the 2004 RFP, NWE continues to explore resource options with energy developers, financial institutions, utilities, and other power marketers.

- b. The following are resources NWE has contracted with or will have included in the portfolio beginning July 1, 2007, and their estimated annual energy.

| <b>Resource</b> | <b>MWh</b>       |
|-----------------|------------------|
| Tiber Dam       | 22,000           |
| Colstrip Unit 4 | 745,000          |
| Judith Gap Wind | 486,000          |
| Basin           | 110,000          |
| <b>Total</b>    | <b>1,361,000</b> |

NWE has two primary contracts with PPL Montana: a 300 MW base load contract and a 150 MW heavy load contract. NWE estimates these contracts result in 3,350,000 MWh per year. Forty percent of the two PPL contracts is about 1,340,000 MWh which is approximately the amount of new generation that is estimated to be part of the portfolio in July 2007.

- c. The solicitation of short-term resources (resources with terms 18 months or less) in the 2004 RFP was in response to resource adequacy concerns. The selected resource bids provide NWE greater certainty for both price and quantity, helping to ensure that power will be available through the June 2007 time frame. These resources provide additional hedging to the portfolio. As noted in NWE's recent data response (Docket NO. D2005.5.88, MCC – 067), NWE's electric portfolio is currently greater than 75 percent hedged.
- d. There were many variables that factored into NWE's decision to not continue its efforts to procure this resource. From NWE's perspective, it contained insufficient certainty regarding: project costs, ability for the project to be completed, and regulatory cost recovery.
- e. The product offered by PPL Montana was a 50MW unit contingent, off-peak product for the period July 2007 through June 2012 at the price of \$42.45/MWh. NorthWestern short-listed the bid and entered into discussions/negotiations with PPL Montana. NorthWestern requested and PPL Montana subsequently included NERC

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holidays to the off-peak product definition. Short list bidders (including PPL Montana) were offered the opportunity to refresh prices. PPL Montana increased the price of this product by \$1.75 per MWH. NorthWestern sought to purchase this product at or below \$33.50 per MWH. The PPL Montana offer did not meet NorthWestern's price target.

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PSC-002                      Regarding: Bridging strategy  
                                    Witness: unknown

- a.        In Volume 1, pp. 11-12 the 2005 Plan describes systematic and opportunistic approaches to acquiring additional energy to replace expiring PPL contracts. Please explain how RFPs and/or other solicitation methods may be used in each approach.
- b.        Volume 2, Chapter 1, p. 7 indicates that the recently approved Judith Gap Energy contract includes an option to purchase the output from an additional 10 turbines. Please explain the process by which NWE will determine whether to purchase the additional output and the timing of such a determination.
- c.        In Volume 1, p. 62, the Plan concludes that it is prudent for NWE to first evaluate the impact of the Judith Gap project on NWE's operations before acquiring additional wind. Information is expected in early 2008. Please clarify whether NWE expects the evaluation to be complete by early 2008, or whether it will have the necessary information to begin the evaluation by early 2008. If the later, how long after the information is available will the evaluation be completed?
- d.        Volume 2, Chapter 1, p. 18 explains that, currently, the renewable electricity production credit expires at the end of 2007. To what extent did NWE factor into its schedule for evaluating Judith Gap's affect on operations the current expiration date for the renewable electricity production credit?
- e.        What contingency plans has the Company made to avoid lost opportunities in the event the renewable energy credit is allowed to expire?

RESPONSE:

- a.        See the forthcoming Addendum to NWE's 2005 Electric Procurement Plan.
- b.        See PSC-002 (d) below.
- c.        It is NWE's intent to have two full years of operational data at Judith Gap Wind before undertaking the analysis. The beginning of accumulating two years of data for evaluation is starting this Spring. The construction of meteorological towers is expected to be completed shortly and many of the start-up issues common to new builds are now being resolved. Once the data is collected, the evaluation and review will likely take several months to complete. Thus, final results are expected in late Spring or Summer of 2008.

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- d. It is expected that Judith Gap Wind will provide a significant quantity of energy for meeting NWE's Default Supply portfolio requirements (about 8 percent of current obligations). This is a high percentage of wind generation for NWE's system, especially considering the lack of dedicated firming resources under Default Supply control. NWE believes ensuring a solid understanding of Judith Gap's effects on the system outweighs the concern of a potential expiration of the production tax credit. NWE will analyze the effect of Judith Gap on operations as soon as possible, given the constraint that sufficient meaningful data must first be available. NWE does not believe that sufficient and meaningful data will be available prior to the potential expiration of the credit.
- e. Until NWE more fully understands the effects of wind on its system, including the incremental system costs of wind, NWE does not believe the potential expiration of the PTC is a lost opportunity. Also, see PSC-002 (d) above. It is premature to presume that renewable energy projects represent a "lost opportunity." In the case of wind, the unknown incremental integration effects and the costs associated with additional system impacts such as transmission usage and integration costs, make the presumption of "lost opportunity" premature.

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PSC-003                      Regarding: Regional load/resource balance  
                                    Witness: unknown

- a.        In Volume 2, Chapter 1, pp. 11-12, the Plan states that the NPCC assessment of regional loads and resources is not a sum of each utility's analysis and because each utility plans and procures independently, this may produce a bias toward underestimation. Please clarify what may be underestimated (loads, resources, both?) and by who (NPCC or the utilities?).
- b.        While the NPCC concluded that the region had a surplus of 1,500 MWa, the PNUCC concluded that the region is already slightly deficit, although the PNUCC data "undoubtedly reflects some bias...." Is this the same bias referenced in part "a" of this question? If not, please explain.
- c.        Is a 1,500 MWa difference in the assessment of the regional load/resource balance significant enough to affect NWE's planning assumptions, the outcome of NWE's planning process and/or NWE's near term action plan? Please explain.

RESPONSE:

- a.        This section of the Plan is noting the potential overestimation by NPCC of the amount of surplus generation resources in the region. For example, if NPCC's assumptions regarding future resource additions are not met, while loads continue to increase, or if the IPP resource does transfer out-of-region, the resource supply surplus may be significantly lower. The calculation of the NPCC regional load/resource balance is approximately a combination of a regional coincident peak for loads and a sum of regional resource plus imports. In practice, numerous utilities serve numerous non-coincident peak loads with a combination of owned resources and purchases with various levels of operational flexibility and ability to resell contracts. The regional coincident peak and the sum of the utilities non-coincident peak are significantly different numbers. Serving the regional coincident peak with the sum of regional resources, plus imports, presumes an efficient marketplace without transmission constraints, neither of which exist in the region. Essentially the Council's plan implicitly assumes a single load and single utility construct, through an efficient marketplace that exchanges power at incremental cost, which is far from the reality in the region.

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- b. No. PNUCC does a sum of individual utilities loads and resource assessment that relies on the reporting of utilities. The competitive power market environment may cause some utilities to not be as forthcoming with load and/or resource information as they might otherwise be. This possible reluctance to share market information is what the quote is referencing.
- c. While significant, an assessment of regional load and resource balance is only a single point of information that provides some limited information to NWE. The ability to use this information is especially limited in this case wherein two respected regional publications provide such differing viewpoints.

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PSC-004                      Regarding: Preferred portfolios  
                                    Witness: unknown

- a.        Please replicate Table 2 (Volume 1, p. 4) but show the expected costs and risks under the expected and high CO2 tax scenarios. In addition to the preferred portfolios in Table 2, include portfolios 10 and 27.
- b.        In Volume 1, p. 50, the Plan states that in the stochastic mode, GenTrader® runs the 20 year analysis period in a Monte Carlo simulation with multiple draws made for each portfolio. In each draw, the model selects certain variables from a distribution curve in order to replicate potential uncertainty of the variables. Other than natural gas prices and electricity prices, what other variables are chosen from a probability distribution curve in the stochastic modeling? Is the amount of a CO2 tax selected from a probability distribution curve?
- c.        It appears from Figures 18-20 and Table 9 (Volume 1, pp. 53-58), that the “Risk Var” for a particular portfolio does not change between the various CO2 tax scenarios. Is this correct?
- d.        What probability did the Northwest Power and Conservation Council assign to the CO2 tax that underlies NWE’s high CO2 tax scenario?
- e.        Assuming that there is some probability that the high CO2 scenario will occur, is it reasonable to infer from Figures 18-20 and Table 9 (Volume 1, pp. 53-58) that uncertainty related to a CO2 tax poses a greater risk for portfolios 2 and 31 than uncertainty related to natural gas and electric price volatility? For example, it appears that portfolio 2 maintains risk exposure of approximately \$0.8 billion due to the possibility of a high CO2 tax, while the risk from natural gas and electric price volatility is \$0.441 billion (\$0.8 billion = \$3.6 billion mean NPV portfolio cost from Figure 20 minus 2.182 billion mean NPV portfolio cost from Table 9).

RESPONSE:

- a.        See the attachment.
- b.        Electricity and natural gas prices are the only values that are selected from a distribution curve in the stochastic analysis. The amount of CO2 tax is not determined from a probability distribution.



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- c. Yes.
- d. On page 19 of the NPCC's Plan, they state: " The probability of a carbon penalty of some level increases during the planning period from 0 percent before 2008, increasing to 67 percent by the end of the planning period. Beginning in 2008, the carbon penalty could be between \$0 and \$15 per ton of carbon dioxide and between \$0 and \$30 per ton beginning in 2016."
- e. Yes. Under the assumption of the high CO2 tax scenario, the resulting cost impact to portfolios 2 and 31 exceeds the corresponding RiskVar values. The comparison between the medium market/gas scenario and the high CO2 scenario is, however, not entirely compatible. The appropriate comparison would be between the medium market/gas scenario and the expected CO2 scenario. In the case of this latter comparison the market/gas risk is the \$0.44B as mentioned for portfolio 2, but the CO2 risk is approximately \$0.24B (\$3.05B from Figure 19 less the \$2.81B from Table 9). Given this comparison, the expected market/gas risk is greater than the expected CO2 risk.

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PSC-005                      Regarding: Avoided costs  
                                    Witness: unknown

- a.        Volume 1, p. 14 of the Plan states that NWE selected \$45/MWh as the avoided cost because it represented NWE's view of the market in October 2005, when the DSM assessment update work was performed. At that time the portfolio modeling was not complete. Is it possible to use the GenTrader® model to estimate avoided costs using a revenue requirements or deferral approach? If not, why?
- b.        If the answer to part "a" is yes, please explain conceptually, how NWE would propose to estimate avoided energy and capacity costs using the GenTrader® model.
- c.        Has NWE performed any avoided cost analyses using the GenTrader® model? If so, please provide and explain the results.
- d.        Please explain to what extent the tick marks for "Expected Load" in Figure 15 represent avoidable costs. (See p. 49, Medium Price Case Load Sensitivity Results. It appears the table should be labeled Figure 16) If any cost information is missing from these results, for example losses, transmission costs, administrative costs, etc., please explain.
- e.        Please explain to what extent the tick marks for "Expected Load" in Figure 15 represent expected average default supply rates. (Refer to the note in previous question)

RESPONSE:

- a.        No. GenTrader® is a dispatch model. It is used to replicate the operation of hypothetical units in a market environment to analyze various potential resource combinations relative to our customers resource needs. At the present time NWE has minimal ability to dispatch resources other than the 50MW Basin Creek natural gas facility. Therefore GenTrader® does not accurately represent the total NWE portfolio operations. One purpose of developing the RPP is to guide the resource procurement processes. NWE does not know what actual possibilities for resource procurement exist prior to conducting procurement processes. Once winning bids are selected, NWE will have the information necessary to calculate avoided costs.
- b.        See response to (a) above.
- c.        NWE has not performed avoided cost analysis using GenTrader.

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- d. The figure on page 49, volume 1 should be labeled as Figure 16. The reference to Figure 15 in the paragraph above the figure should read Figure 16. The tick marks simply denote the 20-Year average cost on a \$/MWH basis for finalist portfolios for the 3 load scenarios with the medium price case. The load sensitivity analysis as presented here is not intended as an avoided cost calculation mechanism. The results are presented to demonstrate modeled cost sensitivity given known changes to the expected load forecast.
- e. The \$/MWH values do not refer to default supply rates.

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PSC-006                      Regarding: Annual portfolio costs  
                                    Witness: unknown

- a.        For each of the 10 portfolios selected for stochastic analysis, and for the low, medium and high market price forecasts, please provide the annual mean portfolio costs that underlie the net present value calculations. If possible, please provide this information in an Excel spreadsheet.
- b.        For each of the 10 portfolios selected for stochastic analysis, please provide the annual cost associated with the expected and high CO2 tax scenarios. Please provide this information in an Excel spreadsheet.
- c.        For portfolio 31, modeled in the stochastic mode with the medium price forecasts, and without the expected CO2 tax costs, please provide the mean annual cost for each resource in the portfolio, including market purchases and sales. If possible, please provide this information in an Excel spreadsheet.
- d.        For portfolio 31, modeled in the stochastic mode with the medium price forecasts, and with the expected CO2 tax costs, please provide the mean annual cost for each resource in the portfolio, including market purchases and sales. If possible, please provide this information in an Excel spreadsheet.
- e.        Provide the same information request in parts “c.” and “d.” of this question for portfolios 18 and 27.

RESPONSE:

- a.        See attachment. The spreadsheet is attached to the electronic version on these responses.
- b.        See attachment. The spreadsheet is attached to the electronic version on these responses.
- c.        The mean annual costs for the resources in the stochastic cases can be approximated from the intrinsic valuations and the detailed unit cost information provided in volume 2, chapter 5. Intrinsic model results for “profit and loss” and “resource cost” are typically quite similar to the mean values from the stochastic studies. The use of nominal levelized costs does not give preference to any resource type versus another. The application of different discount rates to nominal levelized costs over a 20-year period would not change the order or makeup of the preferred portfolios, with the

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exception of the market purchases made in differ portfolios. Changes to the discount rate may alter results somewhat because of the market price variability for both electricity and natural gas in the stochastic studies, where there are differences in the volumes purchased and sold in each year for each portfolio.

- d. Please see response to (c) above.
- e. Please see response to (c) above.

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PSC-007                      Regarding: Volume 2, Chapter 4, sources  
                                    Witness: unknown

- a.        The cost sheet for a 100 MW MT wind power facility shows two columns for “Cost \$/mwh w/o fuel.” The costs in each column are different. Please explain what accounts for the difference and how each column was used in the portfolio modeling.
- b.        Volume 2, Chapter 4, p. 11, Figure 2 shows the basic resource cost information used in GenTrader®. Since GenTrader® is an hourly model, please describe in more detail how the various incremental resource costs are modeled. For example, the table shows the nominal levelized resource costs for various resource types in \$/mwh. Does the model use these costs to determine the hourly and annual costs for a portfolio in the stochastic mode, or are these costs derived from the results of the modeling? Is there a predefined hourly wind shape for wind resources? Are gas plants economically dispatched? Does the model choose when to take coal plants offline for maintenance, or is the timing preset?

RESPONSE:

- a.        The latter column includes a wind integration cost of 12.30 \$/mwh. This number is based on NPCC analysis. The latter column was used in the modeling analysis.
- b.        The nominal levelized costs for generation resources, including capital, fuel, and O&M, are inputs to the GenTrader® models; including both the intrinsic and stochastic studies. These costs are employed in the models to determine hourly and annual costs for each resource within the portfolios. The hourly wind energy production schedule is based on the 2004 meteorological data from the Judith Gap Wind project. Gas-fired resources including combined cycle units and simple cycle units employ economic dispatch logic. The coal gas and tar sands units are base load units with predefined operating schedules. Coal plants employ a predefined maintenance schedule.

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PSC-008                      Regarding: Volume 1, p. 32, Figure 11  
                                    Witness: unknown

- a.        Figure eleven does not appear to reflect the presence of the Basin Creek gas plant. If this is correct, please provide a replacement Figure 11 that includes expected operation of the Basin Creek plant.
- b.        In the GenTrader® stochastic modeling, is the operation of the Basin Creek plant a function of what other resources are included in the portfolio, as well as relative natural gas and electric prices?
- c.        What are the expected annual hours of operation of the Basin Creek plant for 2008 in portfolios 2, 31, 18 and 14?

RESPONSE:

- a.        See attachment.
- b.        The Basin Creek plant is subject to economic dispatch logic in all of the portfolio modeling. Economic dispatch is a function of variable operating costs, fuel cost, and market price of electricity. In hours where the Judith Gap wind resource produces greater than 100 MW, the available capacity from Basin Creek is limited to 25 MW.
- c.        The Basin Creek plant operates for 1,691 hours (mean value) in 2008 for the medium price case in the stochastic studies.

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PSC-009                      Regarding: Discounting  
                                    Witness: unknown

- a.        How sensitive are the rankings of the preferred portfolios to the discount rate used to calculate the net present value of mean annual portfolio costs?
- b.        What is the economic rationale that underlies the 8.46 percent discount rate used to calculate the net present value of the mean annual portfolio costs. (See Volume 2, Chapter 5, p. 13).
- c.        To the extent NWE has access to the Electricity Journal, please review the article titled *Market-Based IRP: It's Easy!!!* by Shimon Awerbuch in the April 1995 issue. Please explain the relevance of this article to NWE's use of its weighted average cost of capital to 1) calculate levelized resource costs in Volume 2, Chapter 4 of the Plan, and 2) calculate the NPV of mean portfolio costs. If possible, please attach a copy of the article to your response.
- d.        If the answer to part "c" is, in whole or in part, that NWE analyzes risks related to different resources/portfolios separately, please explain why discounting is necessary/appropriate.

RESPONSE:

- a.        NWE did not analyze alternative discount rates. NWE has a basis for use of the 8.46% discount rate (see (b) and (c) below), but none for other alternatives. It is not clear what alternative discount rates would have merit in this analysis.
- b.        The 8.46% is the NWE's present allowed rate of return. Therefore the allowed rate of return seems to be a reasonable approximation for what NWE would be allowed to recover from its ratepayers in the event it constructed new resources for rate basing purposes. Given that one of the primary uses of the RPP is to provide a measure for future RFPs, the least cost alternative of NWE constructing and rate basing the new resources is a reasonable measure of approximate value for RFP analysis purposes.
- c.        The article concerns the use of different discount rates for different levels of risk for heterogeneous projects. The article demonstrates that different levels of risk associated with differing cost and revenue streams for each project should be reflected in different discount rates. The article concerns an Integrated Resource Plan (IRP) process where a utility is analyzing investments in the heterogeneous projects with differing risk profiles. NWE has undertaken a Resource Procurement



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Plan (RPP), which differs from an IRP significantly. The RPP does not envision direct investment in the resources but rather procurement of resources through RFP processes. In this capacity NWE is an intermediary between the market and our customers. We are acquiring resource contracts on behalf of our customers. One of the primary purposes of the RPP is to provide background information and a platform for analysis for the RFP processes. Regarding cost risk, until the structure of the RFP obtained contracts is known, the risk cannot be estimated. Regarding revenue risk, all potential portfolios face regulatory risk, which is presumably reflected in the allowed rate of return and the stock price for NWE. Furthermore, NWE has directly analyzed risk for natural gas, market, load, and CO2 in its RPP, and therefore using adjusted discount rates would essentially double count for risk. NWE is convinced that a direct analysis of risk factors is significantly preferable to a subjective analysis via adjusted discount rates. Given that NWE is an intermediary, our customers' cost of capital, the utilities allowed rate of return, is the appropriate discount rate to use in the RPP process. NWE has requested permission from the Publisher, Elsevier, to make copies of the article available. If a reasonable agreement is reached, we will distribute copies to the MPSC and the MCC.

- d. Discounting, on a consistent basis, provides for a measure of the time value of money. Money has a cost, the discount rate, just as all inputs to the electricity production function do. NWE, as an intermediary for our customers, is essentially determining what money obligation streams to lock our customers into through the RPP and subsequent resource procurement processes. Discounting allows the logical comparison of numerous cost streams on a comparable basis.

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PSC-0010            Regarding: DSM acquisition  
                         Witness: unknown

- a.     Did NWE perform an analysis of the effects of accelerating the rate of DSM acquisition on the costs and risks of various portfolios?
- b.     If the answer to part “a” is no, given the Commission’s guidelines encourage steady, sustained investments in DSM, what factors would cause NWE to re-examine the appropriate rate of DSM acquisition?

RESPONSE:

- a.     No. NWE’s DSM Plan includes annual acquisition targets of 5.0 a MW following the two-year ramp-up period in 2004-2006. This same level of DSM acquisition was included in all portfolios evaluated.
- b.     One factor would be a change in the total economically achievable DSM potential, which is currently estimated at 100 aMW and translates into an acquisition rate of 5.0 aMW per year over the 20-year term of the DSM Plan. A higher total economically achievable DSM potential would result in higher annual DSM targets, higher associated budgets, and higher financial incentives that could be offered to future DSM program participants. Conversely, lower DSM potential would result in lower budgets, incentives and annual DSM targets.

Another factor would be a significant change in the costs of various DSM measures. Reduced costs of materials, installation labor, or technology associated with DSM would further improve customer economics and potentially result in higher rates of DSM adoption and DSM program participation. Increased discretionary income could have a similar effect. Alternatively, higher costs for DSM measures and/or lower discretionary income may have the opposite effect.

It remains to be seen whether the DSM programs, as currently designed and implemented, can produce DSM at levels equal to or in excess of the annual targets. And, the level of customer participation in the programs is not fully within the control of NWE, depending in large part on customers’ willingness, motivation, and financial capability to purchase and install DSM measures. Regardless of the incentives offered, NWE efforts at education and persuasion, and/or the presence of compelling economics, customers cannot be forced to install DSM.